**Topic:** The Water Cycle/Global Warming

**Author:** Adris Swift

**Grade Level:** 6th Grade

**Goals:** Students will observe and discuss the controversy concerning global warming. Based on their research they will determine if global warming is either fact of fiction.

**Essential Questions:**

* How does the green house affect our water cycle? (knowledge)
* Describe what happens when the sea level rises? (knowledge)
* Can you distinguish between fact of fiction when it comes to global warming? (comprehension)
* Can you write in your own words your perspective on the issue? (comprehension)
* What questions would you ask of Al Gore if he was present here today? (application)
* Can you compare your opinions with those presented in the text? (analysis)
* Can you see a possible solution to global warming? (synthesis)
* Is there a better solution than what you already know?(evaluation)

**Unit Summary:**

  The students will have an opportunity to have an understanding of how chemical energy affects plants by helping to build a greenhouse in the classroom. With this prior knowledge they will understand that there is a greenhouse effect here on earth. Also, that the natural greenhouse gases act like a big blanket around the earth and extra greenhouse gases mean that more heat gets trapped which will affect our water cycle on earth.

As students explore how the greenhouse gases affect our water cycle, they will know that the greenhouse effect keeps the earth comfortably warm by trapping heat in the atmosphere. Therefore, due to higher temperatures ice and snow will melt which could make the sea level rise. Also, summer rainfall might increase because of temperature rises, and coastal areas could flood because of sea level rises. The students will come to this conclusion through viewing movie clips, research, discussions and forming their own opinions. Therefore they should conclude this lesson with a grasp of the issues and concerns of how global warming might affect life and our water cycle on earth.

**Procedure**

* Building a classroom greenhouse
* Collaborate a classroom blog
* Classroom debates

**Materials:**

* Computers
* NBC clips, You tube clips
* KWL chart
* Rubric

**Subject Area(s): (list all subjects that apply)**

* Science
* Language Arts

**Connections:**

Students will come up with ideas of what they can do on their own, with a group in school, or surrounding neighbors in the community to bring awareness to others about global warming and what they can do to help stop it.

<http://library.thinkquest.org/06aug/00442/gwcommunity.html>

(*This link will be provided to them to give them suggestions*)

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| **Lesson Plan #** | **Lesson Plan Title** | **NBC archive related** |
| Lesson # 1 | **Is There a Greenhouse Effect On Earth, and If So How Does It Affect Our Water On Earth?** | <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=43934>  <http://archives.nbclearn.com/portal/site/k->  [12/collectionnavigator?cuecard=40383](http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=40383) |
| Lesson # 2 | **What Do You Know About Global Warming & What Climate Changes Could Occur In the Future?** | <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=41252>  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=1406> |
| Lesson #3 | **Is Global Warming Fact or Fiction?** | <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=41208>  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=2253> |
| Lesson #4 | **How to Express Your Point Of View Concerning Global Warming?** | <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=2144>  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=3867> |
| Lesson #5 | **What Can We Do Here On Earth?** | <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=42247> |

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| Date: **11/07/09** | Course: **Science** | Unit: **The Water Cycle -**  **Global Warming** |
| Objective:  **Students will be able to . . .**   * Discuss and form opinions about what they have read and observed. * Make predictions about the potential impact of global warming. * Work cooperatively in groups to list and discuss ideas. * Share and write their opinions using the process of pre-writing, drafting, revising, editing and publishing. * Recall information they have learned. | | |
| **Language Arts Standards**:  **Standard 1: Language for Information and Understanding Students will listen, speak, read, and write for information and understanding**   * Students will understand atmospheric processes and the water cycle * Students will understand and apply the basic principles of presenting opinions * Identify information that is implied rather than stated * Apply thinking skills, such as define, classify, and infer, to interpret data, facts, and ideas from informational texts   **Standard 2: Language for L:iterary Response and Expression**   * Students will know environmental and external factors that affect individual and community health * Students will understand and apply the basic principles of logic reasoning   **Standard 3: Language for Critical Analysis and Evaluation**   * Students will effectively use mental processes that are based on identifying similarities and differences   **Science Standards:**  **Standard 4: Students will understand and apply scientific concepts, principles and theories pertaining to the physical setting and living environment and recognize the historical development and ideas in science.**   * Students describe the effects on environmental changes on humans and other populations * Human decisions and activities have a profound impact on the physical and living environment   **Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address the real-life problems and make informed decisions**   * Students analyze science/technology/society problems and issues at the local level and plan and carry out a remedial course of action. | | |
| Materials:  Computers  NBC clips  You tube clips  KWL chart  Rubric | | |
| Procedures:  *Prior to the beginning of this unit a whole class project will be constructing a greenhouse* . (*This will be the background knowledge that the students will have before the beginning of the water cycle unit . It will help them to understand the chemical reaction from heat. )*  **Lesson 1 - Is There a Greenhouse Effect On Earth, and If So How Does It Affect Our Water On Earth?**   * Students will be asked if they've ever been inside a greenhouse. Have them describe the temperature difference between outside and inside the greenhouse.   *(Students will record and notice that there is a temperature change by observing the thermometer.)*   * Students will then predict if the same principle applies to our earth. *( A discussion with the class will help to lead into viewing the next clip.)* * Students will view just 3 minutes of the youtube clip so that they can get a full understanding of the greenhouse effect on earth.   [*http://www.youtube.com/watch?v=5zLuqSYF68E*](http://www.youtube.com/watch?v=5zLuqSYF68E)  *(Do not show the entire clip. Students have to form their own opinion at the end of this unit)*   * Students will then view the NBC clip on the earth’s temperature [*http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=43934*](http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=43934)   *( This clip explains how the temperature on the earth has changed over the years. It also explains the effect it has on the weather)*   * After viewing the clip students will then compare their predictions to the information stated. * Students will then view the next clip   *The water Cycle* [*http://www.youtube.com/watch?v=16M1NgbkJao*](http://www.youtube.com/watch?v=16M1NgbkJao)  *(This explains the stages of the water cycle. )*   * After the you tube clip, the students will then be asked to write and discuss their thoughts on the following questions . . .  1. *Do you think that having a greenhouse effect on earth can cause any changes to the water cycle?* 2. *Describe what happens when the sea level rises?* 3. *What changes would happen to the earth’s surface water?* 4. *Will it be a positive or negative effect on earth?*  * Students will then watch the NBC clip on the green house effect.   [*http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=40383*](http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=40383)  *( Dr. Orrin Pilkey a geologist at Duke University discusses his findings on how the green house effect melts polar ice & how the sea level is rising. )*   * A classroom blog will be set up so that student can write their view points. They will either agree or disagree with the second clip by NBC.   **Lesson 2 – What Do You Know About Global Warming & How Will It Affect Our Water On Earth In the Future?**   * Students will be working in groups and asked to complete the KWL worksheet. They will be asked, *What is global warming?* They will share their ideas on the charts. * Students will view the animation on the web site [*http://epa.gov/climatechange/kids/greenhouse.html*](http://epa.gov/climatechange/kids/greenhouse.html)   (This explains the greenhouse effect and how it contributes to global warming)   * Students will then view the NBC clip.   [*http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=41252*](http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=41252)  (*This individual from the Hoover Institution has a different view. He believes that global warming could be good for us all)*   * A class discussion will begin about what they have viewed on both video clips. They will write what they have learned on their KWL chart. * As an additional assignment students will begin a classroom blog to discuss their view points. * Students will be asked to view an NBC clip and discuss it   <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=1406>  (This clip is about a heat wave that occurred in 2006 which many believe is because of global warming)   * Students will be asked to discuss what changes could happen to our water 100 years from now if global warming exists? * Students will be put into 4 groups. (*two A* g*roups and two B groups*) Group A will focus on questions concerning the effects on and under the earth’s surface. Group B will focus on questions concerning the changes in the atmosphere. * With their group students will exchange questions for the other group to answer. * First, students will make predictions about what they think the answers might be. * Students will then research their answers by using the internet. * Both groups of A and B will compare their answers with their predictions and with each other. * They will continue writing their opinions on our classroom blog.   **Lesson 3 – Is Global Warming Fact or Fiction?**   * A class discussion will be led so students can form opinions about their beliefs on global warming. They will be asked*, If global warming is fact or fiction?* * Students will observe two NBC clips about global warming <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=2253>   *( In this first clip the United Nations reports that global warming if unstopped will lead to widespread drought, hurricanes, rising oceans and species extinctions)*  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=41208>  (*This second clip views a skeptical scientist Professor Lindzen discussing global warming. He feels that scientist know too little about carbon dioxide in global warming to justify frightening the public.)*   * Now that students have observed a variety of perspectives, they will begin their first draft by stating a position of the issue and use the information presented to support their opinions in a class debate.   **Lesson 4 - How to Express Your Point Of View Concerning Global Warming?**   * Students will be asked to explore a variety of perspectives on global climate change. They will take a position on the issue and support it. * Students will then be asked . . .  1. *How concerned should we be about global warming?* 2. *Is global warming a world threat? Why or why not?* 3. *What questions would you ask of Al Gore if he was present here today? (application)* 4. *Can you compare your opinions with those presented in the text? (analysis)* 5. *Can you see a possible solution to global warming? (synthesis)* 6. *Is there a better solution than what you already know?* *(evaluation)*  * So that students can see how others have expressed their opinions to the public, they will view two NBC clips with different views.   <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=2144>  (This is an NBC clip where Al Gore is discussing his perspective on global warming.)  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=3867>  (In this clip evangelical christians are divided on global warming)   * Students will then write a persuasive paper supporting their views on global warming. * In class a rubric will be handed out so students can see what the expectations are for the paper and verbal presentation. * Students will be asked to verbally express their ideas on global warming which will lead to a class debate. * Afterwards all students will use their rubric to rate themselves and others.   **Lesson 5 – What Can We Do Here On Earth?**   * A round table discussion will be held for students to come up with solutions on ways to stop global warming. * They will view 2 clips. One on the official site *climatechangeeducation.org and the other NBC clip* * Students will have the option to do a power point presentation of things we can do to help stop global warming.   <http://passporttoknowledge.com/polar-palooza/whatyoucando/taacc/>  (music video on climate change due to global warming)  <http://archives.nbclearn.com/portal/site/k-12/collectionnavigator?cuecard=42247>  (This NBC clips states that there will be a domino effect if the Greenland ice melts.)  <http://library.thinkquest.org/06aug/00442/gwcommunity.html>  (Use this link to get ideas on how we can help stop global warming) | | |
| Critical Thinking:  *(Questions and findings on critical thinking activities are throughout the lessons)* | | |
| Accommodations for Differentiated Instruction:  Other options for some students can be . . .   * Write a commercial stating their perspectives on global warming. * Design a questionnaire to gather information * Take a collection of photographs to demonstrate a particular point of view | | |
| Resources:  [Climate Observations Substantiate Global Warming Models](http://pubs.acs.org/hotartcl/cenear/951127/pg1.html) [*http://pubs.acs.org/hotartcl/cenear/951127/pg1.html*](http://pubs.acs.org/hotartcl/cenear/951127/pg1.html)  *An article in the Chemical and Engineering News, November 27, 1995, on global warming models.*  [Global Warming](http://www.pacificrim.net/%7Ewgi/resource/gr_sa/gwarming.html)  [*http://www.pacificrim.net/~wgi/resource/gr\_sa/gwarming.html*](http://www.pacificrim.net/~wgi/resource/gr_sa/gwarming.html)  *Information on global warming at the World Game Institute.*  [Global Warming Terminology](gopher://mammatus.sprl.umich.edu:70/00/global_change/air_pollution/global_warming.txt) [*gopher://mammatus.sprl.umich.edu:70/00/Global\_Change/Air\_Pollution/global\_warming.txt*](gopher://mammatus.sprl.umich.edu:70/00/Global_Change/Air_Pollution/global_warming.txt)  *A list of terms and definitions of global warming.*  What’s Up With The Weather?  <http://www.pbs.org/wgbh/warming>  *This report on global warming provides graphs and an interactive activity that helps students recognize sources of daily energy consumption and determine their perspectives for and against global warming*  Index to Climate Change Fact Sheets  http:www.unep.ch/iucc/fs-index.html *Links to over 90 texts on global climate changes.*  [Educational Global Change Websites](http://gcmd.gsfc.nasa.gov/pointers/edu.html) <http://gcmd.gsfc.nasa.gov/pointers/edu.html>  *Websites with educational materials about earth science and global change.*  News Hour Extra: Global Warming Linked to Humans  *This article examines the global changes and how it affects humans and what can be done*  *stopped or reduced*  <http://www.geocraft.com/WVFossils/GlobWarmTest/end.html>  *Questionnaire on Global Warming* | | |
| Assessments:   * Students will be graded on their research findings. * Classroom blog * Presentation of debate * Assignment of group project * Test of the unit | | |
| Assignments:   * As a group project students will make a power point presentation stating the ideas on global warming. * Students will keep an ongoing blog to express their ideas. * Students will write letters to the newspaper to bring awareness about how to help stop global warming. * Students can interview family members or friends on what their views are about global warming and write a report based on their findings. | | |

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| |  | | --- | | **Class Debate : Global Warming/Water Cycle**  Teacher Name: **Mrs. Swift**    Student Name:     \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | |
| *CATEGORY* | | 4 | 3 | 2 | 1 |
| **InInformation** | | All information presented in the debate was clear, accurate and thorough. | Most information presented in the debate was clear, accurate and thorough. | Most information presented in the debate was clear and accurate, but was not usually thorough. | Information had several inaccuracies OR was usually not clear. |
| **Use of Facts/**  **Statistics** | | Every major point was well supported with several relevant facts, statistics and/or examples. | Every major point was adequately supported with relevant facts, statistics and/or examples. | Every major point was supported with facts, statistics and/or examples, but the relevance of some was questionable. | Every point was not supported. |
| **Presentation Style** | | Team consistently used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience. | Team usually used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience. | Team sometimes used gestures, eye contact, tone of voice and a level of enthusiasm in a way that kept the attention of the audience. | One or more members of the team had a presentation style that did not keep the attention of the audience. |
| **Under-**  **standing of Topic** | | The team clearly understood the topic in-depth and presented their information forcefully and convincingly. | The team clearly understood the topic in-depth and presented their information with ease. | The team seemed to understand the main points of the topic and presented those with ease. | The team did not show an adequate understanding of the topic. |
| **Rebuttal** | | All counter-arguments were accurate, relevant and strong. | Most counter-arguments were accurate, relevant, and strong. | Most counter-arguments were accurate and relevant, but several were weak. | Counter-arguments were not accurate and/or relevant |

**Interview Assignment of a Family Member**

1. Have you ever heard of the “Greenhouse Effect”?

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1. Do you know what it is?

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1. Do you know what Global Warming is?

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1. Do you believe it is a real phenomenon?

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1. Is the "Greenhouse Effect" real and do you think it contributes to global warming?

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1. Do you know that over the past 100 years our temperature has increased by 1%?

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1. Do you know how much carbon dioxide is in the earth’s atmosphere?

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1. Can you see a possible solution to global warming?

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1. Do you think there is a better solution than what you already know?

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1. How would you let your community be aware of Global Warming?

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